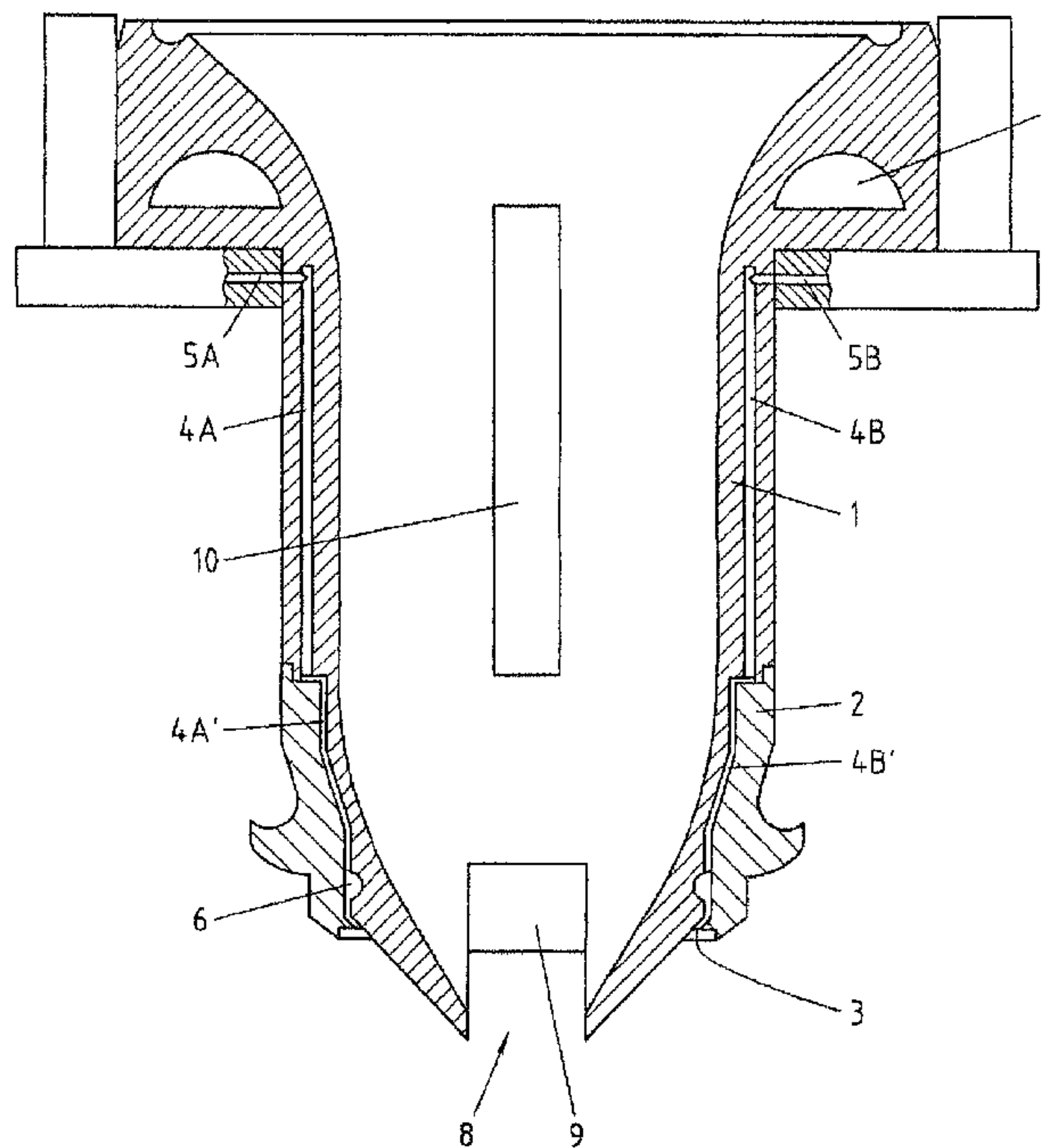




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(54) **Titre : DISPOSITIF ET PROCÉDE PERMETTANT DE REMPLIR DE MANIÈRE DOSEE DES RECIPIENTS, NOTAMMENT DES EMBALLAGES COMPOSITES EN CARTON/PLASTIQUE**  
 (54) **Title: DEVICE AND METHOD FOR THE METERED FILLING OF CONTAINERS, IN PARTICULAR CARDBOARD/PLASTIC COMPOSITE PACKAGES**



(57) **Abrégé/Abstract:**

Represented and described are a device and a method for the metered filling of containers, in particular cardboard/plastic composite packages, comprising at least one storage container for at least one product which is to be filled, means for the

**(57) Abrégé(suite)/Abstract(continued):**

conveying and metering of the at least one product, and a nozzle, wherein the nozzle is arranged above the container which is to be filled, wherein the nozzle body is designed as two parts and has at least one nozzle-shaped inner part and an outer part formed in its lower area around the inner part, and a ring gap is formed between the inner part and the outer part, through which at least one further product can be mixed to the main product. In order to make a homogeneous mixing process possible with simultaneous filling of different products and, in addition, to achieve self-cleaning of the nozzle outlet, provision is made for a ring channel running horizontally in the wall in the lower outer area of the inner part and/or in the lower inner area of the outer part.

**A b s t r a c t**

Represented and described are a device and a method for the metered filling of containers, in particular cardboard/plastic composite packages, comprising at least one storage container  
5 for at least one product which is to be filled, means for the conveying and metering of the at least one product, and a nozzle, wherein the nozzle is arranged above the container which is to be filled, wherein the nozzle body is designed as two parts and has at least one nozzle-shaped inner part and an  
10 outer part formed in its lower area around the inner part, and a ring gap is formed between the inner part and the outer part, through which at least one further product can be mixed to the main product. In order to make a homogeneous mixing process possible with simultaneous filling of different products and,  
15 in addition, to achieve self-cleaning of the nozzle outlet, provision is made for a ring channel running horizontally in the wall in the lower outer area of the inner part and/or in the lower inner area of the outer part.

**Device and method for the metered filling of containers, in particular cardboard/plastic composite packages**

The invention relates to a device and a method for the metered filling of containers, in particular

5 cardboard/plastic composite packages, comprising at least one storage container for at least one product which is to be filled, means for the conveying and metering of the at least one product, and a nozzle, wherein the nozzle is arranged above the container which is to be filled, wherein the nozzle  
10 body is designed as two parts and has at least one nozzle-shaped inner part and an outer part formed in its lower area around the inner part, and wherein a ring gap is formed between the inner part and the outer part, through which at least one further product can be mixed to the main product.

15

Devices for the metered filling of containers are known from practice in many designs. In this situation, filling nozzles with internal ram arrangements are often used, the actuation of which serves to meter the desired quantity of the product  
20 which is to be filled. When more than one product is being filled, this takes place one after another, in that the second product is added in a second filling step to the first product already present in the package which is to be filled. In this way, however, homogeneous mixing of both products is  
25 not possible.

In addition, with the known nozzle forms, the outer contour of the outlet can become contaminated by possible splashing

of the product, and therefore represents an aseptic risk, especially with relatively long production time. This can only be alleviated by manual cleaning, with corresponding product standstill and repeat sterilization.

5

In addition to this, the principle is already inherently known from DE 696 14 089 T2 of mixing different types of ice cream in such a way that a contrasting pattern is produced in the form of a spiral or concentric circles. With this known  
10 device, however, no homogeneous mixture of different source products can be produced.

The present invention is therefore based on the object of designing and further developing a device and method of the  
15 type described in the preamble in such a way that the disadvantages referred to heretofore are reliably avoided.

This object is resolved in respect of the device according to the invention, in that a ring channel running horizontally is  
20 provided in the wall in the lower outer area of the inner part and/or in the lower inner area of the outer part. This ring channel can be formed either as running continuously circumferentially or, as an alternative, can be divided into a plurality of ring segment chambers, corresponding to the  
25 number of further products to be filled. The advantage of the ring channel is that the further products introduced already mix with one another in the ring channel, with the result that even better homogeneous distribution is attained before introduction into the main product.

30

The method according to the invention is characterised in that at least one further product is added to the main

product in a fixed mixing ratio in such a way that the at least one further product emerges onto the outer surface of the outlet of the nozzle body through a circumferential ring gap at an acute angle.

5

The invention has recognised that the filling of a plurality of different products in one single work step is possible, in that the products are brought together in a defined manner immediately before they enter the container, and are mixed in this way. In this way, an overall product which is close to homogeneous can be filled.

According to a further teaching of the invention, the inner part of the nozzle body has at least one channel for the at least one further product, wherein such a channel is formed preferably in the wall of the inner part. In this way, the outside of the nozzle body remains free of add-on elements or pipes which would impede the cleaning and sterilization process.

20

In a further embodiment of the invention, the nozzle body is designed to be essentially rotationally symmetrical and the outer part can be fitted onto the inner part from below. Such a design facilitates both the manufacture of the nozzle body as well as its assembly or disassembly for maintenance purposes.

According to a further teaching of the invention, the inner part can also be provided with at least one circumferential ring channel for conducting a temperature control agent. The temperature control of the nozzle outlets is advantageous, since with outlets with continuous valve rods (rams) through

30

the outlet, jamming of the ram can block the production path. In these cases production can only be resumed after a cooling phase. Because the ram is, as a rule, guided in side cut-out apertures in the inner wall of the nozzle body, the cooling  
5 of the nozzle body also leads to the cooling of the ram.

According to a further preferred embodiment of the invention, the outlet of the nozzle body is formed by a slot-like aperture. It may also consist of a drill hole or a plurality  
10 of drill holes.

If two further products are added to the main product, according to the invention both the products are distributed by way of a ring gap surrounding the filling jet of the main  
15 product by about 180° in each case. This naturally also applies to more than two products to be additionally filled, in which case the distribution takes place in a correspondingly smaller ring segment-shaped area. Depending on the type and quantity of the products being added, it is  
20 also possible, within the scope of the invention for only a part of the additional products to be mixed with one another beforehand, if the ring chamber segments are designed accordingly.

25 A further teaching of the invention makes provision for at least two further products to be added to the main product and for the products to be mixed with one another in a circumferential ring channel before reaching the ring gap.

30 It is therefore also possible with the device according to the invention, for example, for a milk mixture as a basis for feta cheese to be filled in liquid form through the main

nozzle and for salt brine and enzymes to be introduced through the other channels, in such a way that during the filling process the products mix uniformly with one another.

5 In a further embodiment of the invention, the additional channels and the ring gap respectively are used for the introduction of additional aqueous products, sterile air, cleaning media or the like, in order to clean and/or sterilize the nozzle. In particular, the blowing in of cooled  
10 sterile air through the channels located in the wall of the nozzle body can contribute to further temperature control of the nozzles.

Finally, according to another teaching of the invention, it  
15 is also possible for inert gases to be used as further products for reducing the oxygen in the main product when the main product is being filled.

By injecting an inert gas directly into the product filling  
20 jet, the quantity of the oxygen content in the foam can be minimised. This applies in particular to products in which the existence of an oxygen content that is too high in the product represents a critical factor for the product storage life or product quality.

25

The invention is explained in greater detail hereinafter on the basis of drawings representing only one preferred embodiment. The drawings show:

30 Fig. 1 A nozzle for the device according to the invention, without the interior ram, in a vertical section,

- 6 -

Fig. 2 the subject matter from Fig. 1 without the outer part fitted in place,

Fig. 3a a first embodiment of the nozzle outlet, in a side  
5 view, and

Fig. 3b a second embodiment of the nozzle outlet, in a side view.

10 The nozzle for the device according to the invention is represented in its entirety in a vertical section in Fig. 1, but without a ram. Here, the inner part is designated by 1 and the attachable outer part by 2. Due to the ring gap which forms when the outer part 2 is put in place in the lower area  
15 between the inner part 1 and outer part 2, this constitutes a circumferential ring gap nozzle 3. The outer part in this situation is formed in its outlet area in such a way that the product jet emerging from the ring gap nozzle 3 impinges onto the lower outer wall of the inner part 1, and there reliably  
20 prevents the adherence of sprayed matter, foam, or the like.

In the embodiment represented and inasmuch preferred, provision is made for channels 4A and 4B introduced vertically in the side wall of the inner part 1, which  
25 conduct the product via further channels 4A' and 4B', which are milled into the outer side in the lower section of the inner part 1, and, together with the outer part 2, form corresponding channels. The further products are delivered in this situation, as indicated in Fig. 1, through corresponding  
30 delivery lines 5A and 5B respectively.

The channels 4A' and 4B' open into a ring channel 6, which has been introduced in the lower section running circumferentially in the outer circumference of the inner part 1, as can be clearly seen from Fig. 2.

5 In the upper section of the inner part 1 a circumferential ring channel 7 can be seen, which is suitable for conducting of a temperature control agent, in order to be able to retain the temperature of the nozzle body within a predetermined reference value range when in operation.

10

In the embodiment shown, the outlet of the nozzle body is provided with a slot-like aperture 8, which also allows for filling with larger lump products such as meat, cheese or vegetables. The ram, not shown, is in this case guided by perpendicular delimiting walls 9 and corresponding guide slots 10.

15

Figs. 3a and 3b show the lower section of the inner part 1 of the nozzle, wherein in Fig. 3a the ring channel 6 is designed as circumferentially continuous and in Fig. 3b is subdivided by means of separation webs 11 into different ring chamber segments 6A and 6B. These separation webs 11 do not (with two additional products) need to be arranged diametrically opposite. Rather, it is also possible, by means of the arrangement of these separation webs 11, to vary the distribution of individual products for metering or mixing reasons.

20

25

The nozzle claimed for the device according to the invention is simple in structure, easy to clean, can be temperature-controlled and can also be used, in addition to the actual filling process, for cleaning and/or sterilization processes.

30

It is also possible for inert gases to be used as further products in order to reduce the formation of foam in the main product when it is being filled.

5

## C l a i m s

1. Device for the metered filling of containers comprising at least one storage container for at least one product which is to be filled, means for the conveying and  
5 metering of the at least one product, and a nozzle, wherein the nozzle is arranged above the container which is to be filled, wherein the nozzle is designed as two parts and has at least one nozzle-shaped inner part and an outer part formed in its lower area around the inner  
10 part, and wherein a ring gap is formed between the inner part and the outer part, through which at least one further product can be mixed to the at least one product, characterised in that  
a ring channel running horizontally is provided in a wall  
15 in a lower outer area of the inner part and/or in a lower inner area of the outer part.
2. Device according to Claim 1,  
characterised in that  
20 the inner part of the nozzle has at least one channel for the at least one further product.
3. Device according to Claim 2,  
characterised in that  
25 the at least one channel is formed in the wall of the inner part.

- 10 -

4. Device according to any one of Claims 1 to 3,  
characterised in that  
the nozzle is designed to be essentially rotationally  
symmetrical, wherein the outer part can be fitted onto  
5 the inner part from below.
5. Device according to any one of Claims 1 to 4,  
characterised in that  
the ring channel is designed to run continuously  
10 circumferentially.
6. Device according to any one of Claims 1 to 4,  
characterised in that  
the ring channel is designed to run circumferentially and  
15 is subdivided into a plurality of ring segment chambers,  
corresponding to the number of further products to be  
filled.
7. Device according to any one of Claims 1 to 6,  
20 characterised in that  
the inner part has at least one circumferential ring  
channel for conducting a temperature control agent.
8. Device according to any one of Claims 1 to 7,  
25 characterised in that  
the outlet of the nozzle is formed by a slot-like  
aperture.

9. Device according to any one of Claims 1 to 7,  
characterised in that  
the outlet of the nozzle is formed by a drill hole or a  
plurality of drill holes.

5

10. Device according to any one of Claims 1 to 9,  
characterised in that  
the inner part has two channels arranged mutually opposed  
and running essentially vertically for two further media  
to be filled, and in that a ring segment chamber is  
allocated to each channel, surrounding it by about 180°.

10

11. Method for the metered filling of containers, wherein a  
main product is conducted through a nozzle body of a  
filling nozzle into a sterilized container, wherein at  
least one further product is added to the main product in  
a fixed mixing ratio,  
characterised in that the at least one further product  
emerges through a circumferential ring gap at an acute  
angle onto an outer surface of an outlet of the nozzle  
body.

15

20

12. Method according to Claim 11,  
characterised in that  
two further products are added to the main product, and  
in that the two products are distributed by way of a  
circumferential ring gap in each case surrounding by  
about 180° around the filling nozzle of the main product.

25

30

13. Method according to Claim 11,  
characterised in that  
at least two further products are added to the main  
product, and in that the products are mixed with one  
5 another in a circumferential ring channel before reaching  
a circumferential ring gap.
14. Method according to any one of Claims 11 to 14,  
characterised in that  
10 filling channels and the circumferential ring gap  
respectively are used for the introduction of additional  
aqueous products, sterile air or cleaning media, in order  
to clean and/or sterilize the nozzle.
- 15 15. Method according to any one of Claims 11 to 15,  
characterised in that  
as further products, inert gases are used to reduce  
oxygen in the main product when the main product is being  
filled.  
20
16. Device according to any one of Claims 1 to 10, wherein  
the containers are cardboard/plastic composite packages.
17. Method according to any one of Claims 11 to 15, wherein  
25 the containers are cardboard/plastic composite packages.

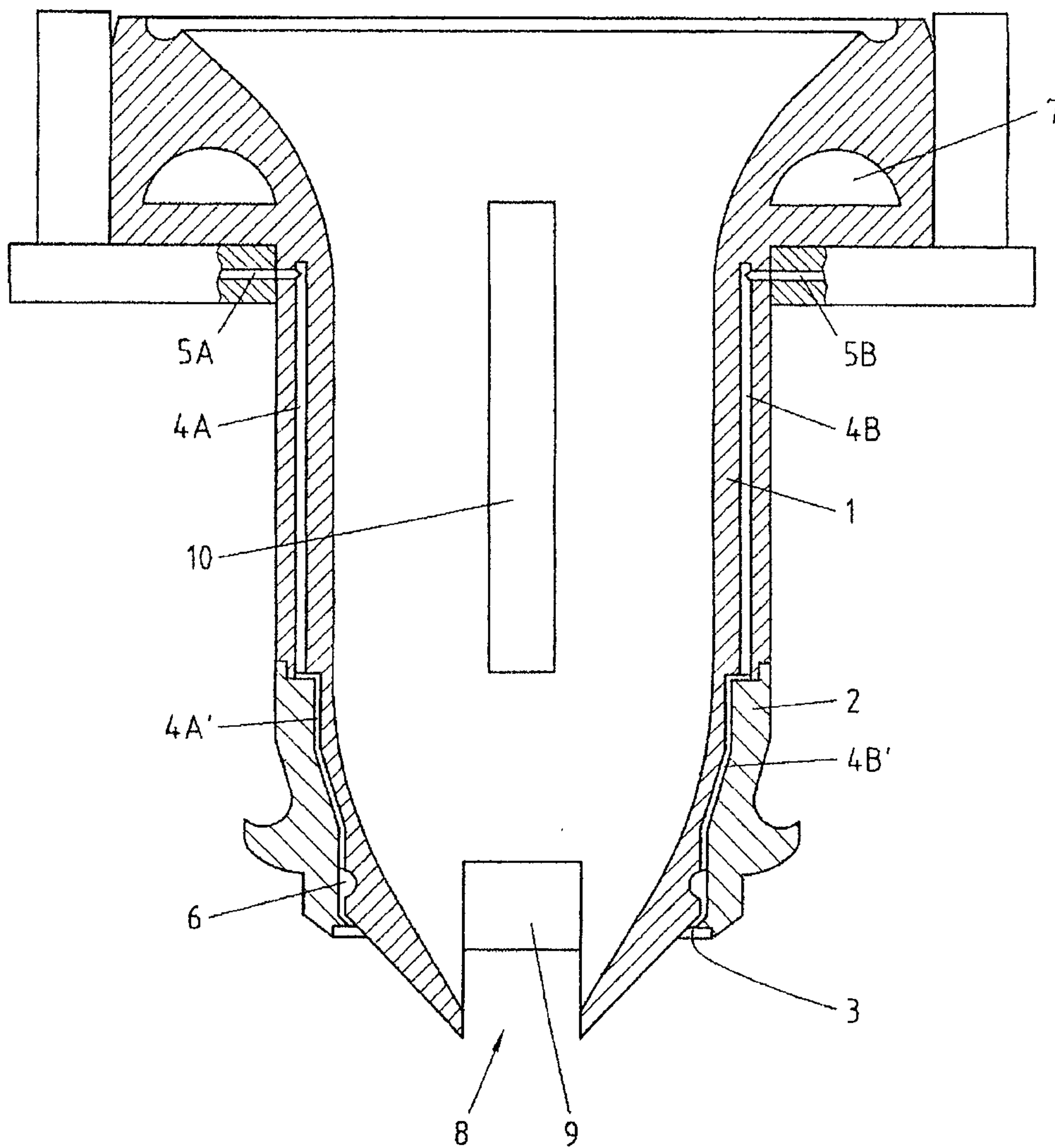


Fig.1

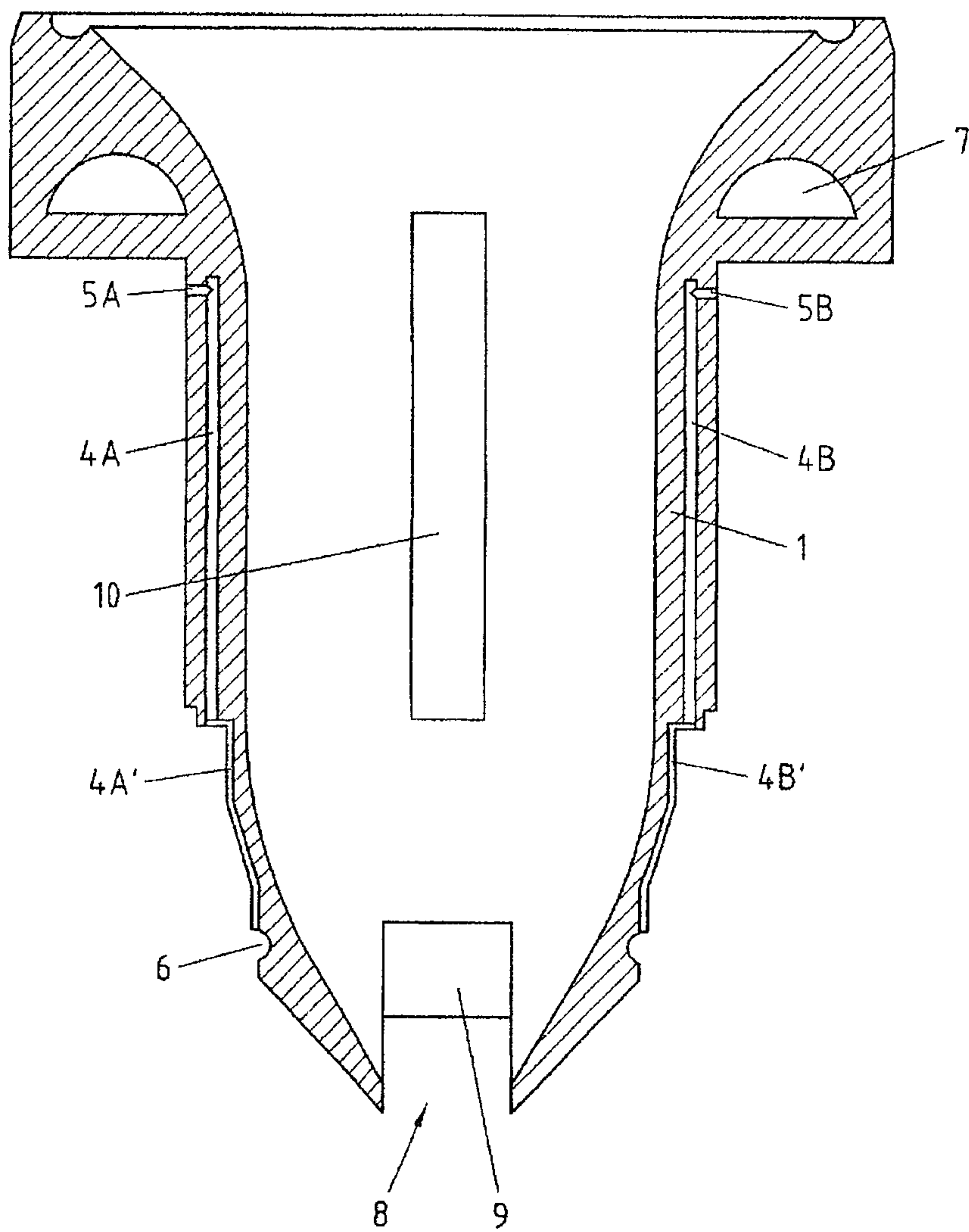


Fig.2

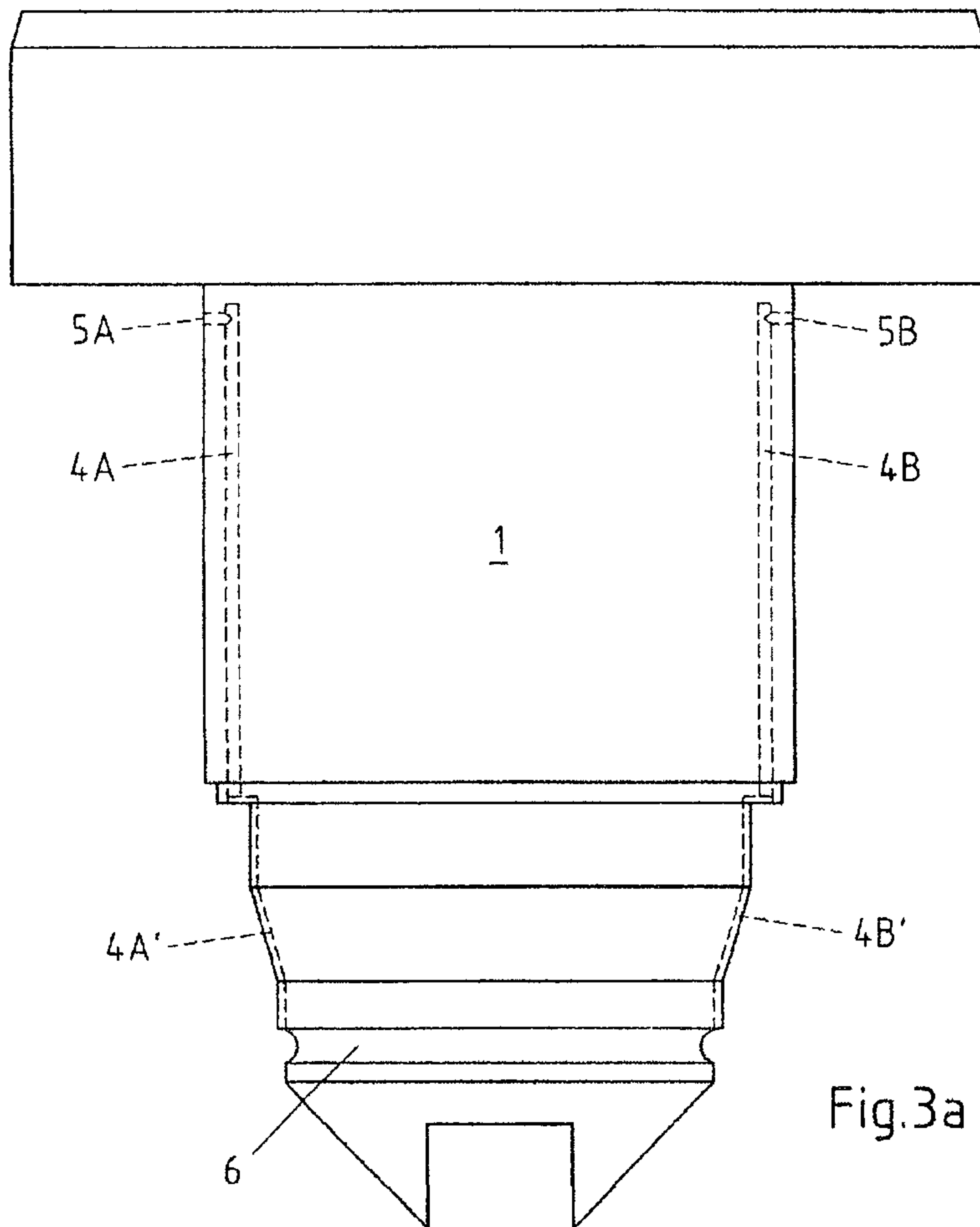


Fig.3a

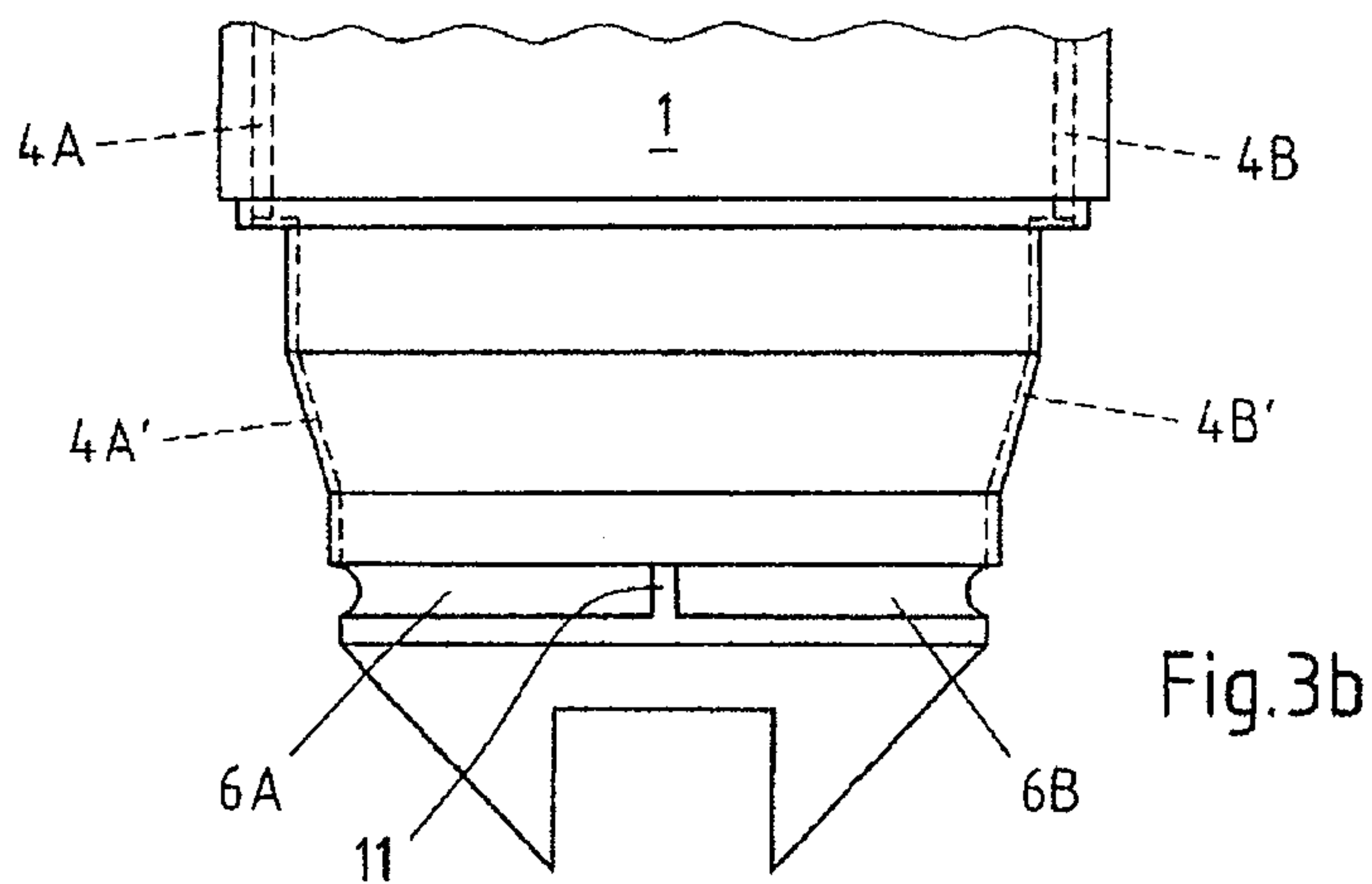


Fig.3b

